A study of a "feebate" policy to reduce CO_2 emissions in the South African automotive industry

by
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Abstract

A study of a "feebate" policy to reduce CO_2 emissions in the South African automotive industry

Globally, climate change is probably the biggest environmental challenge facing the world this century. To accommodate change, the South African government introduced a vehicle emission tax on 1 September 2010. However, the design of the vehicle emission tax focuses on consumers and it might not be most effective in reducing CO_2 emissions to the desired level. Therefore, alternative initiatives need to be identified and implemented to address increasing CO_2 emissions. A "feebate" policy is considered as a possible alternative to reduce CO_2 emissions. A literature review was performed on the topic of "feebate" policies and current tax legislation that could encourage vehicle manufacturers to invest in energy-efficient technology aimed at reducing CO_2 emissions. Based on the literature review, a qualitative empirical study was conducted by means of a questionnaire, which was distributed to nine vehicle manufacturers in South Africa. The study specifically focused on vehicle manufacturers as they have the opportunity to design, develop and introduce energy-efficient technology, which could reduce CO_2 emissions. Results suggest that a "feebate" policy that leads to costs savings should be considered by government to encourage vehicle manufacturers to invest in energy-efficient technology in order to lower CO_2 emissions. It was also noted that, in general, the provisions of the current Income Tax Act No. 58 of 1962 provides little incentive to encourage vehicle manufacturers to invest in energy-efficient technologies to reduce CO_2 emissions.

Opsomming

’n Studie van ’n “feebate” beleid om CO_2 uitlatings te verminder in die Suid-Afrikaanse automobielindustrie

Wêreldwyd is klimaatverandering waarskynlik die grootste uitdaging wat die wêreld in die gesig staar die eeu. Die Suid-Afrikaanse regering het op 1 September 2010 ’n voertuig uitlatingsbelasting ingestel om verandering te akkommodeer. Aangesien die ontwerp van voertuig uitlatingsbelasting egter fokus op die verbruiker, is dit moontlik nie die effektiefste manier om CO_2-uitlatings te verminder en tot ’n aanvaarbare vlak nie. Dus moet alternatiewe inisiatiewe geïdentifiseer en geïmplementeer word om toenemende CO_2-uitlatings aan te spreek. ’n “Feebate” beleid word oorweeg as ’n moontlike alternatief om CO_2-uitlatings te verminder. ’n Literatuurstudie is uitgevoer rakende die onderwerp van “feebate” beleide en huidige belastingwetgewing wat voertuigvervaardigers kan motiveer om te investeer in energie effektiewe tegnologie wat gemik is daarop om CO_2-uitlatings te beperk. Gebaseer op die literatuurstudie is ’n kwalitatiewe empiriese studie uitgevoer deur middel van ’n vraelys, wat aan al nege voertuigvervaardigers in Suid-Afrika gestuur is. Die studie het spesifiek op voertuigvervaardigers gefokus, omrede hulle die geleentheid het om energie effektiewe tegnologie te ontwerp, te ontwikkel en voor te stel wat CO_2-uitlatings kan verminder. Resultate dui daarop dat die regering ’n “feebate” beleid, wat sal lei tot kostebesparing, behoort te oorweeg om sodoende voertuigvervaardigers te motiveer om in energie effektiewe tegnologie te investeer om CO_2-uitlatings te verlaag. Daar is ook bevind dat die huidige Inkomstebelastingwet No. 58 van 1962 oor die algemeen min insentief verskaf om voertuigvervaardigers te motiveer om in energie effektiewe tegnologie te investeer om CO_2-uitlatings te verlaag.

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LIST OF ABBREVIATIONS

During this study, the abbreviations listed below were used.

Abbreviation	Meaning
Act	Income Tax Act No.58 of 1962
APDP	Automotive production and development plan
CDM	Clean development mechanism
NAAMSA	National Association of Automobile Manufacturers of South Africa
RMI	Retail motor industry organisation
SARS	South African Revenue Services

CHAPTER 1
INTRODUCTION

1.1 Background

Globally, climate change is probably the biggest environmental challenge facing the world this century (DEAT, 2004). Pollution and greenhouse gas emissions are the biggest contributors affecting climate change negatively (Anjum, 2008). According to the World Resources Institute (2000), the biggest contributor to greenhouse gas emissions is carbon dioxide (CO_2), and the transport sector contributes 23% of all energy-related CO_2 emissions globally (Schipper, Fabian & Leather, 2009:1). In addition, the energy sector and the transport sector are the only sectors where CO_2 emissions are rapidly increasing (Van Essen, 2010:203), resulting in increased pressure to reduce CO_2 emissions.

Vehicle manufacturers in particular experience pressure to accommodate change, and are faced with two clear but different issues, being improved energy efficiency and reducing CO_2 emissions (Rudman, 2008:15). Making vehicles energy efficient will be a challenge because additional cost needs to be kept to a minimum in order for vehicles to remain attractive to consumers (Rudman, 2008:15). In addition, the disposable income of consumers are also affected by an increase in the fuel price, the implementation of vehicle emission tax and the current recession. As a result, vehicle sales have plummeted and thousands of employees in the automotive industry have lost their jobs (Karrim, 2009). Although reducing CO_2 emissions and improving energy efficiency are important, it is understandable that the priority in the automotive industry should be to safeguard jobs and maintain market interest. Funding from government could serve as a means by which jobs can be preserved and, if funding is sufficient, could also fund additional investment in technology aimed at reducing CO_2 emissions and more efficient fuel technology.

Under the new Automotive Production and Development Plan (APDP), which was announced in September 2008, the South African National Treasury allocated funding to the tune of R870 million to the automotive industry in the form of production subsidies over three years (Karrim, 2009). The APDP replaces the motor industry development plan, and is aimed at facilitating growth, increasing production,

creating employment and encouraging investment in the local motor vehicle industry over time (Karrim, 2009). This is undoubtedly a significant allocation but, considering the current economic status of the automotive industry, these funds will most likely be allocated towards securing jobs and maintaining sales first. These production subsidies were not specifically earmarked to be invested in reducing CO_2 emissions. Therefore, further initiatives should be considered to reduce CO_2 emissions in the automotive industry, which includes vehicle manufactures.

Incentive initiatives to vehicle manufacturers for investing in reducing CO_2 emissions can be achieved by the following means:

- direct funding from government to invest in CO_2 emission reduction; or

- allowing deductions for expenses incurred to invest in CO_2 emission reduction in terms of the Income Tax Act No. 58 of 1962 (Act).

Direct funding from government could be facilitated by the recently implemented vehicle emission tax (environmental levy) imposed on new passenger vehicles manufactured in or imported into South Africa from 1 September 2010 (RSA, 2010a). The vehicle emission tax is based on the amount of CO_2 emissions per vehicle. The purpose of this tax is to serve as a deterrent for people not to act in a manner, which is not in the best interest of the environment. Therefore, it would attempt to influence consumers' purchasing decisions (encouraging the purchase of vehicles with lower CO_2 emissions) but, because of the focus on consumers, it might alone not be the most effective way of reducing CO_2 emissions (Nel, 2009:73). In order to give effect to the highest possible reduction in CO_2 emissions an alternative could be to earmark the funds raised in terms of the new vehicle emission tax for subsequent distribution to vehicle manufacturers to invest in reducing CO_2 emissions. Energy Minister, Mr. Dipuo Peters, also suggested that taxes might be used to fund initiatives that reduce CO_2 emissions (Salgado, 2011). In doing so, a "feebate" policy would be implemented as envisaged by Greene *et al*. (2005:758).

This “feebate” policy will consist of both additional fees/taxes (in this case, the vehicle emission tax) as well as rebates/incentives (in this case, the funding provided to vehicle manufacturers). According to Greene *et al*. (2005:758), such a “feebate” policy, which is revenue-neutral towards government, could also have the additional benefit of improving the perception of the public towards the tax levied. Davis, Levine, Train and Duleep (1995) also recommended that future research be done regarding the sensitivity of vehicle manufactures’ response to “feebates” in terms of the costs of fuel-economy technologies.

In contrast to direct funding, the Act also allows, subject to specific requirements, expenditure to be deducted when calculating taxable income. It is also proposed that investments by companies in energy-efficient equipment should qualify for an additional allowance of up to 15% (SARS, 2009:9). For automobile manufacturers to qualify for these tax incentives, a fair amount of time, ingenuity and financial investment is required right away with some of the tax benefits only realising over a period (i.e. accelerated allowances on assets in terms of Section 12B).

1.2 Problem statement

The South African Government introduced a vehicle emission tax (based on CO_2 emissions of new passenger vehicles manufactured in or imported into South African) on 1 September 2010. The purpose of the vehicle emissions tax is to discourage the purchase of vehicles that emit high levels of CO_2 emissions. However, the design of the vehicle emission tax focuses on consumers, and therefore it might not be effective in reducing CO_2 emissions to the desired level (Nel, 2009:73; Paul, 1997:141). Therefore, alternative initiatives need to be identified and implemented in order to address increasing CO_2 emissions.

A “feebate” policy is considered as a possible alternative initiative to reduce CO_2 emissions (Greene *et al*., 2005:758; Nel, 2009:73). The study being reported here explored the possible implementation of a “feebate” policy as an alternative instrument to reduce CO_2 emissions in the South African automotive industry.

1.3 Objective

The main objectives of the study were to:

- investigate the possible implementation of a “feebate” policy to reduce CO_2 emissions in the South African automotive industry, specifically focusing on vehicle manufacturers; and

- analyse current tax incentives available to South African vehicle manufacturers to invest in reducing CO_2 emissions in order to determine whether these incentives are utilised by vehicle manufactures.

A secondary objective of this study was to create awareness and promote discussions regarding the implementation of a “feebate” policy in South Africa.

1.4 Delimitations

1.4.1 Considerations in terms of the Act

For the purpose of this study, only the following sections of the Income Tax Act were considered: 11(a), 11D, 12B, 12K and 37B. This was done as these sections could provide possible incentives to vehicle manufacturers to invest in research and development of energy-efficient technology.

1.4.2 Automotive industry

The study specifically focused on vehicle manufactures in South Africa as they have the opportunity to design, develop and manufacture efficient technology with regard to fuel efficiencies, which could reduce CO_2 emissions. Vehicle manufactures registered with the National Association of Automobile Manufacturers of South Africa (NAAMSA) were identified. NAAMSA is the official body, which has represented vehicle manufactures for the last fifty years and an important source of information about the automotive industry. All major manufactures of vehicles are registered with NAAMSA (NAAMSA, 2010).

Based on the 2009 vehicle production statistics of NAAMSA, nine South African vehicle manufactures were identified (being BMW, Fiat, Ford, General Motors, Mercedes-Benz, Nissan, Toyota, Volkswagen and Volvo) and included in the qualitative empirical study performed.

1.4.3 Incentives

For the purposes of this study, only incentives in terms of the Act related to reducing CO_2 emissions in the automotive industry were considered. No other incentives (such as subsidies from government) were taken into account.

1.5 Definition of key terms

"Feebate" policy as per Greene *et al.* (2005:758) refers to a fee paid for vehicles with fuel consumption above a predetermined pivot point, while vehicles below the predetermined pivot point receive rebates. "Feebate" policies have been considered in Ontario, Canada and Austria. The proposed "feebate" policy for South Africa consists of a "fee-" obtained from vehicle emission tax that consumers pay when they buy new passenger vehicles, and a "-bate", which is the rebate or funding given to qualifying vehicle manufactures.

Kyoto protocol refers to the Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) adopted at the third session of the Conference of the Parties to the UNFCCC in Kyoto, Japan on 11 December 1997. South Africa is one of 189 countries that ratified the Kyoto Protocol (RSA, 2010b).

Ownership taxes, according to Hayashi, Kato and Val (2001:124), are taxes relating to annual licence fees, taxes for ownership and road and infrastructure-related fees.

Purchase taxes are taxes paid at the purchase of the vehicle and these are based on consumption (Hayashi *et al.,* 2001:124).

Usage taxes are directly related to the use of the vehicle, and include fuel tax (Hayashi *et al.,* 2001:124).

1.6 Assumptions

The study focused on the concept of a "feebate" policy consisting of an additional tax ("fee-") and an incentive or rebate ("-bate"). The "fee" could be obtained from various sources, but for the purpose of this study, it is assumed that it would be obtained from the funds generated by the recently introduced vehicle emission tax that consumers pay when buying new passenger vehicles. The incentive or rebate represents funding given to vehicle manufactures in order to encourage CO_2 emissions reductions.

The vehicle emission tax introduced on 1 September 2010 can be earmarked as funds to distribute as an incentive for manufactures who qualify for the research and development of energy-efficient vehicles. The funds that are generated by means of the vehicle emission tax would provide an incentive, which should be substantial enough to encourage manufacturers' decisions to invest in research and development of energy-efficient vehicles.

1.7 Importance and value of the research

Greene *et al. (*2005:758) commented that to date "feebate" policies have been widely considered but not often used. This study therefore investigated the possible implementation of a "feebate" policy in South Africa as such policy could result in increased reductions in CO_2 emissions by the transport sector by addressing the objectives as set out in 1.3.

1.8 Research design, methods and scope

A literature review was performed as suggested by Hofstee (2006:121), as secondary literature was studied on the topics of "feebate" policies and current tax legislation that could encourage vehicle manufacturers to invest in reducing CO_2 emissions. The literature review was not intended to produce something new, but rather to form a basis for this study and to understand the objectives and to develop a questionnaire.

Based on the literature review, an empirical study was conducted by means of a questionnaire. Upon receipt of the responses from the respondents on the questionnaire, the data contained in the responses were analysed and discussed in order to:

- investigate the possible implementation of a "feebate" policy to reduce CO_2 emissions in the South African automotive industry, specifically focusing on vehicle manufacturers; and

- analyse current tax incentives available to South African vehicle manufacturers to invest in reducing CO_2 emissions in order to determine whether these incentives are utilised by vehicle manufacturers.

The questionnaire was distributed to nine vehicle manufacturers in South Africa as per NAAMSA. The study specifically focused on these vehicle manufacturers in South Africa as they have the opportunity to design, develop and manufacture efficient technology with regard to fuel efficiencies, which could reduce CO_2 emissions.

1.9 Outline of chapters

Chapter 2 provides a definition of a "feebate" policy and explains the working of such a policy. References are made to current policies that lead to reductions in CO_2 emissions as well as current "feebate" policies in other countries.

In Chapter 3, the current tax incentives available to South African vehicle manufacturers to invest in reducing CO_2 emissions are discussed. Such tax incentives are in the form of deductions and allowances contained in the Act. These deductions and allowances were considered in order to determine whether (or not) vehicle manufacturers utilise such deductions and allowances.

In Chapter 4, the results of the questionnaire are discussed (including discussions pertaining to the population and response rate). The results of the questionnaire were classified into the following two categories in order to address the objectives:

- the implementation of a “feebate” policy to reduce CO_2 emissions in the South African automotive industry, specifically focusing on vehicle manufacturers; and

- current tax incentives available to South African vehicle manufacturers to invest in reducing CO_2 emissions in order to determine whether these incentives are utilised by vehicle manufactures.

Chapter 5 concludes on the objectives of the study. General comments received from vehicle manufacturers are also included for future reference. The study then ends with final remarks and recommendations on areas of further focus for possible future research.

CHAPTER 2
CONSIDERING THE MERITS OF A "FEEBATE" POLICY

2.1 Background

The fact that CO_2 emissions are strongly increasing globally in the transport sector necessitates additional policies to reduce CO_2 emissions. There are several different policies that can be used to reduce CO_2 emissions. In a study by DeCicco (2006), it was found that CO_2 emissions could be reduced by encouraging and informing consumers to use energy-efficient vehicles. However, the focus should not only be on encouraging consumers to change their behaviour, but also on encouraging vehicle manufactures to improve energy-efficient vehicles, as the manufacturer also plays a role in reducing CO_2 emissions in the transport sector. Therefore, a policy that can address both the behaviour of consumers as well as the behaviour of vehicle manufacturers to invest in energy-efficient vehicles is needed.

To encourage vehicle manufacturers to invest in researching and developing energy-efficient vehicles, they need to be rewarded for such behaviour. Mainstream businesses in South Africa are of the opinion that legislation, potential cost savings and managing business reputation are some of the leading factors that influence decision-making when it comes to changing behaviour in favour of the environment (Van der Merwe, 2010).

In order to influence decision-making to reduce CO_2 emissions, government can either merely legislate policies (require compulsory participation) or introduce policies that could lead to cost savings (encouraged participation). The following sections consider legislation and cost-savings policies and the way a "feebate" policy could assist in addressing the leading factors that influence decision-making in order to reduce CO_2 emissions.

2.2 Policies in the form of legislation (compulsory participation)

The hardest things to change in business and in individuals are behaviour and thinking regarding climate change (Paul, 1997:118). Van der Merwe (2010) confirmed this in an article on a report by PWC (*"Appetite for change: global business perspectives on tax and regulation for a low carbon economy"*) that businesses are mostly influenced to change behaviour in favour of the environment when there are policies introduced by government in the form of legislation and regulation. Thus, an effective policy should be driven and be implemented by government.

Furthermore, a policy that can address the behaviour of both consumers and vehicle manufacturers would be ideal. This section will consider policies in South Africa that will affect consumers and vehicle manufacturers alike.

2.2.1 Aimed at consumers

South African government-driven policies aimed at affecting consumers' behaviour to reduce CO_2 emissions can be categorised as *ownership taxes*, *purchase taxes* and *usage taxes*. According to Hayashi *et al.* (2001:135–138), usage tax is most effective in reducing CO_2 emissions as consumers drive shorter distances and have more efficient driving habits. Ownership tax affects consumer behaviour by convincing them to buy smaller vehicles that have less CO_2 emissions and thereby reducing the cost of owning the vehicle. Purchase tax was found to have very little influence on reducing CO_2 emissions (Hayashi *et al.*, 2001:135–138).

The South African vehicle emissions tax introduced on 1 September 2010 can be seen as purchase tax. The main purpose of vehicle emissions tax is to reduce CO_2 emissions through taxing the consumer based on the CO_2 emissions output per passenger vehicle in an attempt to affect consumer behaviour (discouraging the purchase of vehicles that emit higher CO_2). However, CO_2 emissions are only emitted when a vehicle is driven; thus, a buyer of a small vehicle who drives 10 000 km per year, pays the same amount of tax as a buyer who drives 100 000 km per year (Osborne, 2010). As indicated, this purchase tax will not necessarily have the desired effect of reducing CO_2 emissions, confirming what Hayashi *et al*. (2001)

stated, namely that vehicle emission tax might not be as effective as ownership and usage taxes.

Currently in South Africa, ownership taxes include license fees (including VAT) and toll fees. License fees are charged annually and are based on the weight of the vehicle but do not take the environment into consideration (Nel, 2009:46). Kunert and Hartmut (2007:307) stated that, if license fees are increased to account for energy-insufficient vehicles, it is classified as ownership tax. Hayashi *et al.* (2001:135–138) maintained that, although ownership taxes are more effective than purchase taxes, the increase in ownership taxes to accommodate environmental considerations will not produce the desired result and that usage taxes are therefore more effective in this regard.

Usage taxes in South Africa consist mainly of transport levies, with a few insurance companies that have introduced pay-as-you-drive insurance (which includes VAT). Transport levies consist of the general fuel levy, the Road Accident Fund levy, customs and excise levy and the Illuminating Paraffin Marker levy (SARS, 2009:15). Fuel levies are, however, not directly levied based on environmental concerns (such as CO_2 emissions). Hayashi *et al.* (2001:135–138) remarked that fuel levies are the most effective taxes to reduce CO_2 emissions.

In South Africa, certain policies have thus already been introduced that can have an effect on CO_2 emissions but these policies only focus on changing the behaviour of the consumer and not so much on changing the behaviour of the manufacturer. A policy therefore needs to be introduced by government that could address the behaviour of both the consumer and manufacturer, and a “feebate” policy will be able to achieve this.

2.2.2 Aimed at vehicle manufacturers

Currently in South Africa, there are no government legislation policies aimed directly at affecting vehicle manufacturers' behaviour to develop energy-efficient vehicles in order to reduce CO_2 emissions. Indirectly, the policies that affect consumer behaviour, like the purchase, usage and ownership taxes could have an effect on the vehicle manufacturer, as the demand for more energy-efficient vehicles could drive the type of vehicles that are manufactured. However, there are no direct legislation policies yet that could change the behaviour of vehicle manufacturers towards the environment. A "feebate" policy might be a policy that could achieve the aforementioned.

2.3 Policies that lead to cost saving (encouraged participation)

As explained in section 2.2, the above taxes (policies) focus on the consumer and not so much on the vehicle manufacturer. Findings by Nel (2009:22) led to the conclusion that the above policies (taxes) would not be as effective in reducing CO_2 emissions as investing in technology that would lead to energy-insufficient vehicles. Osborne (2010), the CEO of the Retail Motor Industry organisation (RMI) argued that, instead of taxing consumers, government needs to introduce incentives in the vehicle market that could lead to CO_2 emissions reductions.

According to Hayashi, Button and Nijkamp (1999), there are policies to give incentives in order to develop vehicles with low CO_2 emissions, and it is working. Hayashi *et al.* (2001:125–126) also indicated that policies that are incentive-driven will persuade vehicle manufactures to favour low CO_2 emission alternatives by researching and developing low emission type vehicles. This view was supported by Van der Merwe (2010), who asserted that business favours environmental tax incentives.

Businesses felt the answer to implementing such a policy lays in a combination of "carrot and stick" – tax incentive and regulation (Van der Merwe, 2010). Therefore, a policy that will reward low CO_2 emissions and penalise high CO_2 emissions should be implemented.

Johnson (2006:3115–3118) studied a cap-and-trade policy with a refunded emission tax. He concluded that a cap-and-trade policy together with a refunded emission tax, which is an incentive, would be more probable to reduce CO_2 emissions than just the cap and trade. The study found that a cap-and-trade policy only caps CO_2 emissions at a specific level, whereas an incentive in the form of refunded emission tax could create a climate of stable investments with sustained incentives for reduced CO_2 emissions over the long term. A conclusion that can be made from the study by Johnson is that a policy where there is a tax levied, which is distributed as an incentive, could lead to reducing CO_2 emissions significantly in the transport industry.

The incentives that are distributed could be used by manufacturers to cover the cost of investments in research and development of energy-efficient vehicles. As explained in section 2.1, cost saving is a factor that influences decision-making when it comes to changing behaviour in favour of the environment. Therefore, a policy that can bring about cost savings needs to be introduced by government to change behaviour towards the environment.

Current South African policies in the automotive industry where incentives are provided relate to the export of vehicles (Black & Mitchell, 2002), facilitating growth, increasing production, creating employment and encouraging investment in the local motor vehicle industry (Karrim, 2009). These incentives lead to cost savings for their intended purposes but they do not relate to cost savings in the research and development of energy-efficient vehicles.

Other incentives from government are in the form of allowances and deductions but there is no direct funding that leads to cost savings in terms of the research and development of energy-efficient vehicles. Van der Merwe (2010) claims that businesses feel that the criteria to qualify for current environmental tax incentives are too stringent and that these incentives do not motivate businesses sufficiently to change behaviour. Thus, incentives in South Africa that can lead to cost savings for vehicle manufacturers are needed to change their behaviour towards the environment.

A “feebate” policy can bring about cost savings for vehicle manufacturers and this could lead to a change in manufacturers’ behaviour. As explained in section 1.5, a “feebate” implies that additional taxes (fees) are levied and distributed as incentives (rebates). For the purposes of this study, the fees that need to be raised for *“feebate” policy* are the taxes raised by government, which in South Africa is the vehicle emission tax introduced on 1 September 2010 (RSA, 2010a).

The implementation of the vehicle emission tax will result in increased funds for the South African government. As reports have shown, National Treasury expected to earn about R450 million in the 2010/2011 financial year from the vehicle emission tax introduced (Osborne, 2010). Alternative funds can also be generated if the transport fuel levies (usage taxes) and ownership taxes are increased to incorporate CO_2 in the assessment base (Paul, 1997). These increased funds could be earmarked specifically for the investment in reducing CO_2 emissions and could serve as a source of funding to provide incentives for the automotive industry to invest in the reduction of CO_2 emissions. Thus, cost can be saved by manufacturers, which could lead to a change in favour of the environment if a “feebate policy is used.

Another benefit of a “feebate” policy, where the additional taxes levied (fees) are distributed as incentives (rebates), is that such a policy will be revenue-neutral towards government. This means that all the additional taxes collected by government should be allocated and distributed as incentives. If such a policy is made transparent and revenue-neutral it could result in increased taxpayer’s confidence towards the policy as it would not be perceived to be an income-generating exercise from government only but also distributing funds to reduce for the investment in reducing CO_2 emissions (Greene *et al*., 2005:759). Bandivadekar (2008:25) stated that the appeal of a “feebate” policy lies in the fact that the policy can take care of the rebate (incentive) and the administrative costs.

2.4 The merit of a "feebate" policy

Currently in South Africa, we do not have a "feebate" policy or a policy that is similar to a "feebate" policy. Several studies have been done on "feebate" policies in other countries, including the USA, Canada, Europe and Asia.

Greene *et al.* (2005:758–759) contended the merit of a "feebate" policy in the United States. Peters, Mueller, De Haan and Scholz (2008:1364) suggest that public acceptance for a "feebate" policy in Europe is comparatively high and added that, when the changes are considered within a disaggregated car fleet, a reduction in CO_2 emissions will prevail. They also indicated that the design and detail function of a "feebate" policy does not need to be completely understood by people but the mere fact that it can be seen as a policy that will reduce CO_2 emissions is acceptable for the public.

Osborne (2010) and Van der Merwe (2010) stated that, in South Africa, business regards incentive-driven policies (which would include a "feebate" policy) as necessary for changing behaviour towards the environment.

The following are some of the possible benefits of a "feebate" policy:

- it has the potential to maintain, or even increase, the vehicle manufacturers' revenues with the added benefit of providing a continuous incentive to improve fuel technologies (Greene *et al*., 2005:770–771);

- it could possibly be the most effective policy to be implemented in order to reduce fuel consumption and carbon dioxide emissions (Greene *et al*., 2005:758);

- if the "feebate" policy is made revenue-neutral it could improve taxpayers' attitude towards taxes levied for environmental concerns (for example vehicle emission tax) – it would not be perceived as being only an income-generating tool (Greene *et al*., 2005:771);

- the “feebate” policy would provide a continuous incentive for manufacturers to improve on fuel economy technologies. Greene *et al*. (2005:758) concluded that a “feebate” policy could provide an ever-present extra incentive to increase fuel economy whenever new, more cost-effective technologies are identified;

- a study by Davis *et al*. (1995, cited in Greene *et al*., 2005:759) in the United States consistently found that manufacturers’ adoption of “fuel economy technology” accounted for about 90% of the overall increase in fuel economy brought about by “feebate” policies;

- a “feebate” policy will also influences consumers’ behaviour to be environmentally friendly on account of the vehicle emission tax that is raised;

- a “feebate” policy in South Africa can lead to cost savings in designing energy-efficient vehicles which will make the South African automotive industry more competitive globally; and

- cost savings can also help with the safeguarding of jobs as money can be saved on the design of the vehicle instead of on retrenching workers.

The following are some of the possible weaknesses of a “feebate” policy:

- the consumer is not rewarded directly by a “feebate” policy as the manufacturer receives the benefit for researching and developing energy-efficient vehicles;

- because the consumer is not directly rewarded by the implementation of a “feebate” policy, consumer behaviour will not necessarily change, as DeCicco (2006) stated, the consumer leads the potential for improvement in energy efficiency; and

- the aim of a “feebate” policy is to bring more energy-efficient technology into the market to reduce CO_2 emissions; some of the reduction can however be offset due to increased driving (Bandivadekar, 2008:25).

2.5 Conclusion

As can be seen from the above discussions, a policy that is introduced by government and that leads to cost savings is necessary to change the behaviour of consumers and manufacturers in lowering CO_2 emissions. Section 2.4 indicated the merit of a "feebate" policy and also answered possible questions regarding a policy that is driven by government and that leads to cost savings. The next two sections will conclude on the above literature review.

2.5.1 Policies in the form of legislation (compulsory participation)

Currently in South Africa, the vehicle emission tax implemented by government is focused on changing the behaviour of consumers and not on changing the behaviour of manufacturers. A policy that can address the behaviour of both might be most effective in reducing CO_2 emissions. A "feebate" can achieve this as it consists of the fee in the form of vehicle emission tax that can change consumers' behaviour as government intended it to do. It also can change the behaviour of the manufacturer by providing an incentive to reduce CO_2 emissions if the manufacturer complies with certain regulations.

Another benefit of a "feebate" policy is that it is revenue-neutral towards government and therefore it could increase taxpayers' confidence in government and consequently in such a policy. The policy itself cannot be perceived to be an income-generating exercise from government, but rather as an exercise where environmental tax is ploughed back into environmental projects. Van der Merwe (2010) stated that business regards this as important. Thus, a "feebate" policy implemented by government could affect the behaviour of both the consumer and the manufacturer towards the environment and could possibly bring about a healthy perspective towards taxes levied for environmental concerns. The policy could also overcome the hurdle of politics, as it is revenue-neutral and environmentally driven.

2.5.2 Policies that leads to cost savings (encouraged participation)

Policies that lead to cost savings will help encourage manufacturers to make decisions that will change their behaviour towards the environment (Van der Merwe, 2010). Studies on a “feebate” policy in other countries showed that a “feebate” policy could produce incentives, which may lead to cost savings for businesses. For South African purposes, a “feebate” policy could lead to cost savings, which would affect the behaviour of businesses towards the environment, and therefore more efficient technology could be developed to reduce CO_2 emissions.

2.5.3 General

Unfortunately, the biggest hurdle to implementing a policy that would lead to reduced CO_2 emissions is neither economical nor technical, but political (Paul, 1997:126). Implementing a policy aimed at addressing environmental concerns could play a major role in the way the public views government’s ability either to address the current economic situation or the way government respond to climate change.

Another hurdle in implementing a policy to respond to climate change challenges is adequate collaboration between relevant parties, specifically vehicle manufactures. Chapter 4 will explore the ideas and sentiment of vehicle manufactures towards a “feebate” policy and current tax incentives to invest in the reduction of CO_2 emissions, and the results could be used as a basis for further collaboration between government and vehicle manufacturers.

In South Africa, there are currently not any policy similar to a “feebate” policy considered in this chapter. However, there are several sections in the Act, according to which vehicle manufacturers can get possible tax incentives (allowances or deductions) to invest in reducing CO_2 emissions. These incentives are not related to the fees, the taxes being levied for reduction in CO_2 emissions. The detail and effectiveness of these incentives will be discussed in Chapter 3.

CHAPTER 3
CURRENT SOUTH AFRICAN TAX INCENTIVES FOR REDUCING CO_2 EMISSIONS

3.1 Background

According to Van der Merwe (2010), South African businesses believe that government plays an important role in environmental policies through legislation and regulation to drive change towards the environment. The majority of these businesses felt that the South African government does not have a long-term environmental tax and regulation policy in place to change the behaviour of businesses towards the environment (Van der Merwe, 2010). Current environmental tax and regulation policies in South Africa are the vehicle emission tax and several sections of the Income Tax Act No.58 of 1962 that relate to tax incentives to reduce CO_2 emissions.

As explained in Chapter 2, the vehicle emission tax was introduced on 1 September 2010 but this tax might not be sufficient to change the behaviour of consumers to reduce CO_2 emissions, and alternatives are needed to reduce CO_2 emissions. Furthermore, consumers alone cannot be held responsible for reducing CO_2 emissions as vehicle manufacturers need to contribute by reducing CO_2 emissions. Vehicle manufacturers can contribute by manufacturing energy-efficient vehicles. In order to encourage vehicle manufacturers to do this they need to be given incentives for their research and the development of energy-efficient vehicles.

This chapter will discuss current tax incentives available to South African vehicle manufacturers to invest in research to reduce CO_2 emissions.

The following sections from the Act will be considered as these sections could provide possible incentives to vehicle manufacturers to invest in research and development of energy-efficient technology or reducing CO_2 emissions (Sustainability SA, 2011):

- General deductions allowed in the determination of taxable income (section 11(a));
- Deductions in respect of scientific or technological research and development (section 11D);
- Deduction in respect of certain machinery, plant, implements, utensils and articles used in farming or production of renewable energy (section 12B);
- Exemption of certified emission reduction (section 12K); and
- Deduction in respect of environmental expenditure (section 37B).

The requirements of each of the abovementioned sections will be considered from the perspective of South African vehicle manufacturers that would wish to claims such deductions or allowances for investments in reducing CO_2 emissions. It would then be possible to assess whether, in theory, such deductions or allowances would be accessible to vehicle manufacturers as incentive to investment in reducing CO_2 emissions.

Section 12I and 12L were also considered but excluded from any further considerations in this study. Section 12I provides an additional industrial policy project allowance as an incentive to assist the transformation of current production processes and methods to attain cost reductions and greater efficiency in the use of resources (Wilcocks, 2011:256). However, these allowances are not directly linked to invest in research and development of energy-efficient technology or reducing CO_2 emissions and were therefore not considered. Section 12L provides a special allowance for energy efficiency savings that could serve as incentive in reducing CO_2 emissions. However, section 12L is not yet currently effective (it will only come into effect from a date to be determined by the Minister of Finance) and was therefore not considered as it currently provides no incentive.

3.2 General deductions allowed in the determination of taxable income (section 11(*a*))

According to section 11(*a*) expenditure and losses actually incurred in the production of income can be deducted from income derived from carrying on any trade, provided that, such expenditure and losses are not of a capital nature. With reference to vehicle manufacturers and expenditure for investments in reducing CO_2 emission, it is necessary to consider whether such expenditure would be in the production of income.

In *Port Elizabeth Electric Tramway Co Ltd v CIR* (1936 CPD) it was held that for expenditure to be in the production of income such expenditure must necessary and closely connected to the activities carried on by a taxpayer in carrying on a trade. For vehicle manufacturers to claim a deduction they should therefore prove that expenditure incurred for investments in reducing CO_2 emission was a necessary concomitant of their trade (manufacturing vehicles). However, investments in reducing CO_2 emission are currently voluntary and not required by any law in order for vehicle manufacturers to carry on manufacturing and selling vehicles. It would therefore appear as if it would be difficult for a vehicle manufacturer to fulfil the burden of proof, in terms of section 82, that the expenditure were incurred in the production of income and for the purposes of a trade.

Even if vehicle manufacturers succeeds in proving that such expenditure is in the production of income, it will however not reduce the actual cost of manufacturing energy-efficient vehicles (which emit lower CO_2 emission). Rudman (2008:15) correctly stated that such energy-efficient vehicles tend to cost more than other vehicles. Thus, the consumer will still have to pay more for the additional expenditure incurred by way of research and development of energy-efficient technology, and thus not render it financially viable. Consumers are reluctant to pay extra for the energy-efficient technology; therefore, an incentive is needed that will reduce cost in manufacturing fuel-efficient vehicles (Rudman, 2008:15).

In conclusion, although the general deduction formula is a possible option the onus of proof on the taxpayer will be subjected to the specific facts and circumstances of every taxpayer. It would therefore not be possible to discuss all possible arguments for such deductions if reference is made to the different vehicle manufacturers. Therefore, this study will focus on specific deductions contained in the Act (3.3 – 3.6) and not on a detailed discussion of the general deduction formula contained in section 11(*a*).

3.3 Deductions in respect of scientific or technological research and development (section 11D)

The automotive industry could contribute to CO_2 emissions reduction through enhanced engine concepts, alternative fuels development and "beyond engine technology" (Rudman, 2008:15).

Vehicle manufacturers are currently not geared to contribute much to alternative fuels development but rather to enhanced engine concepts and "beyond engine technology". Enhanced engine concepts would include electric vehicles, the fuel efficiency of engines and hybrids (all of which could contribute to reduce CO_2 emissions). Research and development of such a nature will however require a fair amount of time, ingenuity and financial investment. From an income tax perspective, there are tax incentives for such investments subject to certain requirements.

Section 11D of the Act allows for the following deductions with regard to research and development subject to specific requirements being met:

- a deduction of 150% of the expenditure (this refers to "running" expenditure and not assets acquired for the research) incurred for research and development; and

- an accelerated allowance over three years (50%, 30% and 20%) on any building, part thereof, machinery, plant, implement, utensil or article or improvement thereto acquired specifically for research and development.

The specific requirements, *inter alia*, are that the research and development activities pursued by the taxpayer should result in the following:

(a) the discovery of novel, practical and non obvious information; or

(b) the devising, development or creation of any:
   (i) invention, as defined in section 2 of the Patents Act No. 57 of 1978;
   (ii) design, as defined in section 1 of the Designs Act No. 195 of 1993 that qualifies for registration under section 14 of that Act;
   (iii) computer program, as defined in section 1 of the Copyright Act No. 98 of 1978; or
   (iv) knowledge essential to the use of such invention, design or computer program.

This information, invention, design, computer program or knowledge should also be of a scientific or technological nature, and the taxpayer's intention should be for it to be used in the production of his or her income, or is discovered, devised, developed or created by the taxpayer for purposes of deriving income.

For vehicle manufacturers investing in research and development to reduce CO_2 emissions, there are two possible problematic requirements, which have to be satisfied. Firstly, the research and development should result in something "new", an invention or design. Secondly, it should be in the production of income (same as section 11(a)).

Patentable inventions in terms of section 25 of the Patents Act No. 57 of 1978 require that the invention must be something new, which does not form part of the state-of-the-art immediately before the priority date, as per the Patents Act of that invention. This entails that the invention cannot be similar to any other invention/information which has already been made available to the public (whether in the Republic or elsewhere) by written or oral description, by use or in any other way.

A design in terms of Section 1 of the Designs Act No. 195 of 1993 could be an aesthetic design or a functional design. *Aesthetic* design refers to the cosmetic design (which appeals to and is judged solely by the eye) and which would most

likely not include design aimed at CO_2 emissions reduction. A *functional* design means any design applied to any article having features, which are necessitated by the function that the article to which the design is applied, is to perform.

If a vehicle manufacturer succeeds in research and development of engine concepts, which are either "new" (ground-breaking) inventions or functional designs that reduce CO_2 emissions, there could be tax deductions in terms of section 11D. It is not impossible but it would require a fair amount of time, ingenuity and financial investment to achieve the aforementioned. It should however be kept in mind that, according to the second requirement of section 11D of the Act, such invention or design should also be incurred in the production of income.

Consumers do not always fully value the impact of their actions on the environment, as it appears that they seem unwilling to pay a premium for investments in reducing CO_2 emissions (Rudman, 2008:15). Therefore, if vehicles are manufactured (which incorporates the research and development aimed at reducing CO_2 emissions) it is most probably not going to result directly in consumers buying these vehicles. There is currently also no enacted legislation, which forces vehicle manufacturers to reduce CO_2 emissions. Based on interpretation of the wording of section 11D and the expected behaviour of consumers it would likely be difficult for a vehicle manufacturer to proof that such investments are in the production of income. The requirement of whether or not investing in research and development in reducing CO_2 emissions is in the production of income therefore seems to be contentious. The question is whether the fiscus would allow more grace when research and development are incurred, and whether such research would be successful in reducing CO_2 emissions.

The incentives received from the research and development expenditure deduction of 150% and the accelerated allowance assets used for research and development are not necessarily reducing the cost of manufacturing energy-efficient vehicles. The 150% deduction as well as the allowance will reduce the income of the manufacturer and therefore less taxation will be paid. The cost saving will, however, not necessarily be attributed to the cost of the vehicle being manufactured and the consumer might therefore not reap any benefit in the form of a reduced selling price.

However, it can however motivate the manufacturer to manufacture more energy-efficient vehicles. As explained before that cost savings is a factor that could change to change behaviour that will lead to reducing CO_2 emissions.

Another area for further focus on possible incentives or cost savings is the fact that the components industry, which is part of the automotive industry, is a global industry and many South African companies are either subsidiaries or joint venture partners of multinationals who conduct research and development overseas (Furlonger, 2009).

Presumably, these foreign joint venture partners would then recover their investment in research and development (incurred in their country of domicile) by increasing the transfer price to the South African companies. These South African companies could therefore contribute to the reduction of CO_2 emissions but, as the research and development expenditure had not been incurred in South Africa, they would obtain no benefit in terms of section 11D. On importation of these components from their foreign joint venture partners, deductions would be allowed in terms of section 11(*a*) of the Act (subject, however, to the transfer pricing implications of section 31). It therefore appears as if such South African companies would indirectly obtain a tax benefit for the research and development incurred by their foreign joint venture partners without having to comply with the specific requirements of section 11D of the Act (on assumption that the purchase price of imported components includes allocated research and development costs).

3.4 Deduction in respect of certain machinery, plant, implements, utensils and articles used in production of renewable energy (section 12B)

Section 12B of the Act currently provides for an accelerated allowance over three years (50% in year 1, 30% in year 2 and 20% in year 3) for investments in renewable energy and the production of bio-fuels. Vehicle manufacturers that implement equipment, which generates energy from renewable sources, could therefore qualify for the allowance in terms of section 12B. Generating energy from renewable sources could also have the added benefit of reducing CO_2 emissions if implemented effectively.

In addition, it was proposed in the 2009 Budget Tax Proposal (SARS, 2009:9) that investments by companies in energy-efficient equipment should qualify for an additional allowance of up to 15% on condition that there is documentary proof of the resulting energy efficiencies (after a two- or three-year period), certified by the Energy Efficiency Agency. Vehicle manufacturers that invest in energy-efficient equipment could therefore also qualify for the additional allowance, if the proposal is implemented. Investing in energy-efficient equipment now would, however, only result in a benefit if and when the Energy Efficiency Agency certifies the energy efficiency after two or three years.

Vehicle manufacturers can therefore consider changes to their production process to qualify for section 12B allowances. Based on the extent to which energy-efficient equipment and equipment which generates energy from renewable sources are introduced there could be tax incentives, which would indirectly result in reduced CO_2 emissions. These investments, however, require financial investments now, which will only provide tax incentives after two or three years, which could place additional pressure on the financial status of the vehicle manufacturers.

3.5 Exemption of certified emission reduction (section 12K)

As explained in section 1.5 above, South Africa is one of 189 countries to have ratified the Kyoto Protocol, which established emission reduction targets (Van Wyk, 2009). The Kyoto Protocol is an environmental instrument of the UNFCCC, which provides mechanisms to ensure that developed countries achieve their emissions reduction targets. One of the instruments which developed countries can use to meet part of their emission reduction targets is certified emission reduction (CER) credits, which can be traded and sold (UNFCCC, 2009). In terms of the proposed section 12K of the Act, the revenue derived from the sale of such CER credits would be wholly exempted from normal income tax (Van Wyk, 2009). The establishment of clean development mechanism (CDM) projects allows emission-reduction (or emission-removal) projects in developing countries to earn CER credits. The Department of Minerals and Energy is the designated national authority in South Africa responsible for registration of CDM projects.

The registration of CDM projects is however rigorous, and the issuance process was designed to ensure real, measurable and verifiable emission reductions that are additional to what would have occurred without the project (UNFCCC, 2009). Deriving any possible benefit for CER credits requires a substantial investment and focused effort. To date, there are 21 registered CDM projects in South Africa as per the Department of Energy (2011), none of which included any of the South African vehicle manufacturers considered in this study.

Based on the rigorous registration process and significant investment required to obtain any possible benefit from CER trading it seems unlikely that vehicle manufacturers would be able to obtain any benefit.

3.6 Deduction in respect of environmental expenditure (section 37B)

Prior to the introduction of section 37B, tax legislation did not catered for the deduction of general capital environmental expenditure and post-trade environmental expenses (for example decommissioning and restoration), although these expenses are a legal precondition for operations in many instances (Wilcocks, 2011:259). The Act makes provision for expenditure incurred in rehabilitation of the environment. Prior to the introduction of section 37B into the Act, there was also no similar deduction available for vehicle manufacturers (Eversheds, 2011).

Since the introduction of section 37B(2), an allowance is made for deduction from income equal to:

- in the case of a new and unused *environmental treatment and recycling asset*, 40% per year of the cost, and 20% over the next three years if the asset is used in the taxpayer's trade and it is required by law; and

- in the case of a new and unused *environmental waste disposal asset*, 5% per year of the cost if the structure is permanent, used in the taxpayer's trade and required by law.

Environmental treatment and recycling asset refers to any air, water, and solid waste treatment and recycling plant or pollution control and monitoring equipment. *Environmental waste disposal asset* refers to any air, water, and solid waste site, dam, dump reservoir, or other structure of a similar nature, or any improvement thereto (RSA, 2010a).

Therefore, where a vehicle manufacturer has incurred expenditure in respect of an *environmental treatment and recycling asset* or *environmental waste disposal asset* a possible deduction could be allowed in terms of section 37B(2).

Section 37B might, however, also allow a deduction for expenditure incurred in respect of the remediation or restoration of the environment as result of the vehicle manufacturers trade. Section 37B(6) states that expenditure or losses incurred for remediation or restoration of the environment because of a trade previously carried out by the taxpayer may only be deducted if:

- it if such deduction is required by law;

- it would otherwise have been allowed as a deduction in terms of section 11, had the taxpayer still carried on a trade; and

- it is not otherwise allowed as a deduction.

However, claiming a deduction in respect of the remediation or restoration of the environment would only come into effect after a vehicle manufacturer has ceased to carry on a trade. Therefore, these deductions will not encourage any earlier investments in reducing CO_2 emissions. For the purposes of the questionnaire considered in Chapter 4 the focus will be placed on *environmental treatment and recycling asset* or *environmental waste disposal asset* in terms of section 37B(2).

3.7 Conclusion

Van der Merwe (2010) stated that businesses feel that the criteria to qualify for current environmental tax incentives are too stringent and that these incentives do not satisfactorily motivate businesses to change behaviour.

Based on the above literature review on the respective sections of the Act, it appears that it is arduous to receive incentives in the form of deduction. Furthermore, it also is not relevant to vehicle manufacturers. Findings based on the consideration of the different sections of the Act are subsequently discussed.

3.7.1 General deductions allowed in the determination of taxable income (section 11(*a*))

It might be difficult to qualify for section 11(*a*) in respect of expenditure to invest in research and development of energy-efficient technology or reducing CO_2 emissions. The two main issues of contention are:

- whether (or not) the expenditure relating to the reduction of CO_2 emissions is incurred in the production of income. As consumers are not inclined to pay extra for the fuel-efficient vehicles it difficult to substantiate that such expenses are incurred in the production of income; and

- where vehicle manufacturers receive a deduction it would not necessarily reduce the cost of the vehicle and consumers will still have to purchase the vehicle at a higher cost (Rudman, 2008:15).

Therefore, section 11(*a*) might not provide an incentive (deduction) for vehicle manufacturers in respect of expenditure relating to the reduction of CO_2 emissions.

3.7.2 Deductions in respect of scientific or technological research and development (section 11D)

It might also be arduous to qualify for deductions in terms of section 11D as the following needs to be substantiated:

- that the research is a “new” invention or a functional design that reduces CO_2 emissions; and

- that the expenditure incurred in the research and development of energy-efficient vehicles was incurred in the production of income (due to the interpretation of section 11D and the behaviour of consumers not wanting to pay a premium for energy-efficient vehicles).

If the above are, however, substantiated a vehicle manufacturer will qualify for a deduction of 150% in respect of the non-capital expenditure in respect of research and development and an capital allowance on assets used for research development. These deductions and allowances will lead to cost savings that could change the behaviour of vehicle manufacturers towards the environment.

3.7.3 Deduction in respect of certain machinery, plant, implements, utensils and articles used in production of renewable energy (section 12B)

Section 12B of the Act currently provides for an accelerated allowance of assets used in the production of renewable energy and bio-fuels. An additional 15% allowance can also be received if it can be proved that the assets used resulted in energy efficiencies over the next two to three years.

Vehicle manufacturers can change their production processes to make use of these assets to qualify for section 12B allowances. This can be an incentive to reduce CO_2 emissions; however, these tax incentives will only realise after two or three years, placing additional pressure on the financial status of vehicle manufacturers.

3.7.4 Exemption of certified emission reduction (section 12K)

If a vehicle manufacturer can successfully register a CDM projects any CER credits received may be sold of which the proceeds will be exempt from normal income tax. Receiving the proceeds exempt from normal income tax could provide an incentive to vehicle manufacturers to invest in the reduction of CO_2 emissions.

Unfortunately, registering for these CDM projects is difficult and it therefore seems unlikely that vehicle manufacturers would be able to obtain any benefit.

3.7.5 Deduction in respect of environmental expenditure (section 37B)

Vehicle manufacturers could qualify for an incentive in respect of expenditure incurred during the remediation or restoration arising from any previous trade. Such expenditure will be deductible after the trade had been ceased and therefore it will take time to receive them. However, such expenditure will not be incurred in the production of income and might not encourage vehicle manufacturers to invest in the reduction of CO_2 emissions.

Considering the above sections in the Act, it appears that there are indeed some incentives for vehicle manufacturers to invest in the reduction of CO_2 emissions. Individually they do not appear to be beneficial for vehicle manufacturers, but combined they can have a beneficial effect on changing the behaviour of vehicle manufacturers to research and develop energy-efficient technology.

Following in Chapter 4 the sentiment of vehicle manufactures towards these current tax incentives to invest in the reduction of CO_2 emissions will be explored.

CHAPTER 4
DISCUSSION OF RESULTS

4.1 Background

In Chapters 2 and 3, a literature review was performed based on the objective set out in section 1.3. The literature review was performed not to produce something new, but rather to form a basis for this study based on the objectives. The literature review was used to design a questionnaire that will meet the objectives of the study.

4.2 Questionnaire

4.2.1 Design of the questionnaire

When designing a questionnaire, the researcher should search for similar questionnaires with the same type of questions (Bradburn, Sudman & Wansink, 2004:23). In doing this, the researcher have some sort of assurance that the questions in the questionnaire are relevant and have been used before.

A similar questionnaire was found in the form of a survey done by PWC in 2010, namely *"Appetite for change: global business perspectives on tax and regulation for a low carbon economy".* Questions were adapted from this PWC survey and reworded for the questionnaire in this study to ensure that the questions are relevant to vehicle manufacturers and that they will meet the objectives. Refer to **Annexure 1** for the questionnaire used in this study.

Due to the nature of this study, the way the questions were formulated was very important for meeting the objectives. Therefore, the participants had to be able to find it easy to understand and answer the questions so that the desired results could be achieved. To test this, the questionnaire was given to several accountants for review, as people with accounting backgrounds would, in all likelihood, have been the ones at the vehicle manufacturer responsible for answering the questions.

The questionnaire was also given to a representative of the Centre for Statistical Consultation (CSC) at the Stellenbosch University, who is a specialist in the use of questionnaires and the interpretation of data received from it. The representative reviewed the questionnaire to ensure that questions were formulated in a proper way and therefore that the data obtained from it would be relevant and usable for this study.

The questions in the questionnaire as well as the results were categorised and discussed under the following headings:

- investigating the possible implementation of a "feebate" policy to reduce CO_2 emissions (section 4.3);
- an analysis of current tax incentives utilised by South African vehicle manufacturers to invest in reducing CO_2 emissions (section 4.4); and
- general comments received from South African vehicle manufacturers (section 4.5)

4.2.2 Participants

Participants in this study were all nine vehicle manufacturers in South Africa (BMW, Fiat, Ford, General Motors, Mercedes-Benz, Nissan, Toyota, Volkswagen and Volvo). The study specifically focused on vehicle manufacturers in South Africa as they have the opportunity to design, develop and manufacture efficient technology with regard to fuel efficiencies, which could reduce CO_2 emissions. The vehicle manufacturers used in this study were all registered with NAAMSA.

NAAMSA is the official body representing South African vehicle manufacturers for the last fifty years and an important source of information about the automotive industry. All major manufacturers of vehicles are registered with NAAMSA (NAAMSA, 2010). Based on the 2009 vehicle production statistics of NAAMSA nine vehicle manufacturers of South Africa were identified and included in the qualitative empirical study. These manufacturers are the only current manufacturers in South Africa.

Each vehicle manufacturer was contacted by means of telephone to indentify a participant (representative person of the vehicle manufacturer) that would be able and knowledgeable to answer the questions and who was also in a senior or management position at the vehicle manufacturer. The average number of years of experience in the vehicle manufacturing industry per participant was 12 years, which provided assurance of the quality of responses received.

The questionnaires were then emailed in Word format to all participants. This was done to save time and to make it more simplistic for the participant to complete. The participants had three months to complete the questionnaire during which they were continuously reminded of the questionnaire if there was no response. After three months, the questionnaires had to be returned.

Of the nine participants, seven valid responses were obtained, one declined to participate and one did not respond. These seven respondents were deemed representative of the characteristics of vehicle manufacturers of South Africa. Confidentiality concerns were cited as the reason why one of the vehicle manufacturers declined.

The respondents' responses will be discussed in the following subsections which relate to the objectives of this study:

- investigating the possible implementation of a "feebate" policy to reduce CO_2 emissions (section 4.3);

- an analysis of current tax incentives utilised by South African vehicle manufacturers to invest in reducing CO_2 emissions (section 4.4); and

- general comments received from South African vehicle manufacturers (section 4.5)

4.3 Investigating the possible implementation of a "feebate" policy to reduce CO_2 emissions

Mainstream businesses in South Africa argue that legislation, potential cost savings and managing business reputation are some of the leading factors that influence decision-making when it comes to changing behaviour in favour of the environment (Van der Merwe, 2010).

Responses by vehicle manufacturers that reflect their views towards policies in the form of legislation (compulsory participation) and policies that leads to cost savings (encouraged participation) are discussed in the following sections. This will be done in attempt to investigate the attitudes of vehicle manufacturers towards the possible implementation of a "feebate" policy to reduce CO_2 emissions.

4.3.1 Policies in the form of legislation (compulsory participation)

Vehicle manufacturers are convinced that government should have primary responsibility for leading behavioural change in relation to reducing CO_2 emissions in the automotive industry.

All respondents agreed that government should be involved and 57% indicated that a combination of business, government and individuals should share in the responsibility of leading behavioural change in relation to reducing CO_2 emissions in the automotive industry.

This concurs with the statement by Van der Merwe (2010) that government should help drive change towards the environment by reducing CO_2 emissions. Vehicle manufacturers responded on the effective tools to reduce CO_2 emissions as indicated in Table 1 which follows.

Table 4.1: Effective tools to reduce CO_2 emissions

Tools	Not effective	Somewhat effective	Very effective
Regulation	29%	71%	0%
Tax charges	0%	86%	14%
Tax incentives	0%	29%	71%

The majority of respondents agreed that regulation and tax charges would only be somewhat effective in encouraging them to reduce CO_2 emissions. This agrees with the survey by PWC (2010), but also in the latter survey, companies said that they believe that tax incentives are even more effective than regulation and tax charges.

Findings summarised in Table 4.1 support this view as the majority of South African vehicle manufacturers (71%) indicated that tax incentives are considered to be the most effective tool to encourage businesses to reduce CO_2 emissions. Thus, government could introduce an incentive-driven policy as an alternative method to drive change in the automotive industry in order to develop energy-efficient technology to reduce CO_2 emissions. As explained, a “feebate” policy is an incentive-driven policy, which government could use to achieve this.

However, it is important that government properly regulate an incentive-driven policy, as regulation can also play an important role in achieving targets on CO_2 emissions, as indicated by the manufacturers in their responses below.

Table 4.2: The role of regulation in achieving targets on CO_2 emissions

	No role	Some role	Significant role
Tax regulation	0%	43%	57%
Other regulation	0%	71%	29%

Vehicle manufacturers indicated that they feel that regulation can help them achieve CO_2 emission targets if those were set by government. The majority were of the view that tax regulation could be more effective in achieving these targets.
This agrees with the study done by PWC in 2010 on "Appetite for change" where 95% of companies interviewed around the world agreed that regulation and tax could play some role in achieving targets on national greenhouse gas emissions. In the same survey, 68% of carbon taxpayers were supporting carbon taxes (PWC, 2010). They felt that taxes were an effective tool of reducing greenhouse gas emissions.

Currently in South Africa, carbon tax in the form of vehicle emission tax payable by consumers is supported by 71% of vehicle manufacturers. These manufacturers maintained that something had to be put in place to change behaviour towards the environment. Although the respondents supported the vehicle emission tax, they were of the opinion that a vehicle emission tax would not have the desired effect of reducing CO_2 emissions. They listed the following reasons for their answer:

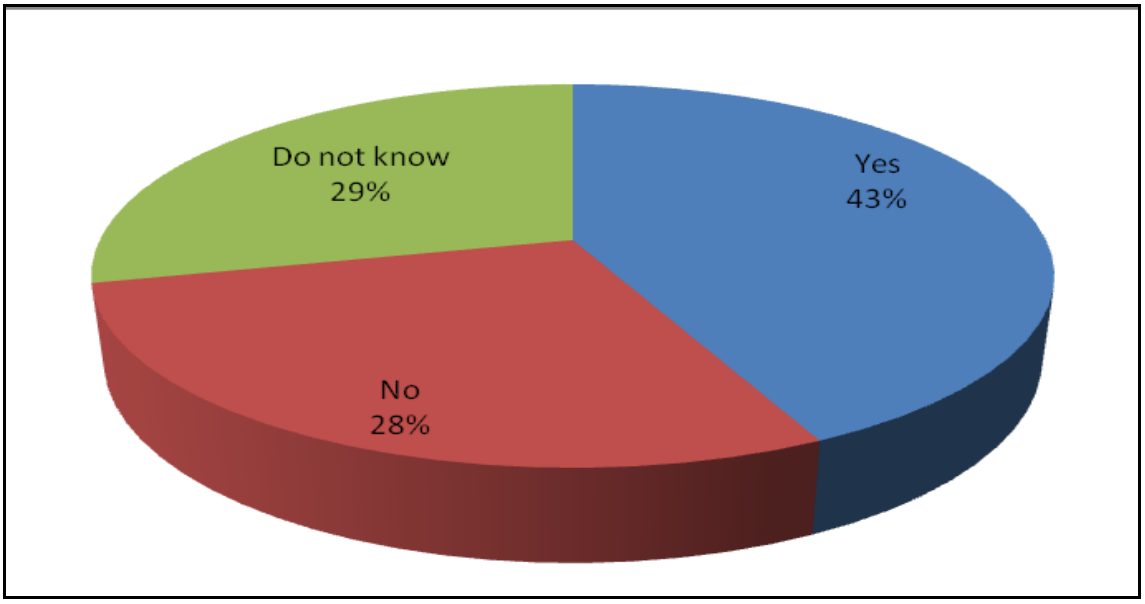
- the quality of fuel in South Africa needs to improve otherwise the reduction in CO_2 emissions through vehicle emission tax will not have the desired effect; and

- the administration process around the vehicle emission tax should also be improved to make it effective.

One of the respondents, who were not in support of vehicle emission tax, was involved in discussions with the Department of Trade and Industry as well as the National Treasury and said it had become clear that the vehicle emission tax is merely another tax burden under the guise of "going green". Thus, when government designs an incentive-driven policy it will have to be clear from the outset that it is not just another way of collecting tax, but that it is revenue-neutral. Greene *et al*. (2005:759) stated it was found that a "feebate" policy is revenue-neutral and it could increase taxpayers' confidence towards the policy, as it would not be perceived to be an income-generating exercise from government.

Vehicle manufacturers were asked in the questionnaire whether they would perceive a "feebate" policy as just another attempt by government to generate income (refer Figure 4.1 on the following page).

Figure 4.1: Perceptions of vehicle manufacturers towards a "feebate" policy as just another tax



The above responses do not agree with the statement by Greene *et al*. (2005:759) regarding a "feebate" policy, namely that it is revenue-neutral and it could increase taxpayers' confidence towards the policy, as it would not be perceived to be an income-generating exercise from government.

Thus, if a "feebate" policy is implemented in South Africa, government should explain to vehicle manufacturers that the purpose is not to create another means of generating tax but that it is revenue-neutral and can lead to cost savings for vehicle manufacturers.

4.3.2 Policies that leads to cost savings (encouraged participation)

Vehicle manufacturers in particular experience pressure to accommodate change and are faced with the challenge of developing energy-efficient technology to reduce CO_2 emissions (Rudman, 2008:15). To make vehicles energy efficient will be a challenge because of the additional cost in the form of research and development. These costs need to be kept to a minimum, as "green" vehicles need to be attractive to consumers (Rudman, 2008:15). This will be difficult without alternative funding, as changes need to take place in the automotive industry to develop energy-efficient technology.

All respondents agreed that there would be change in the way they conduct business as a result of CO_2 emissions over the next 2–3 years. The changes they envisaged pointed to investing in technology that could reduce CO_2 emissions as vehicle manufacturers are encouraged worldwide to do so. Respondents also indicated that because the vehicle emission tax was introduced, they needed to invest in their vehicles so that they have less CO_2 emissions.

Investing in energy-efficient technology will inevitably lead to increased costs for vehicle manufacturers. In Chapter 2, it was explained that cost savings for businesses are instrumental in changing behaviour, especially towards the environment. To achieve cost savings, government could introduce incentives that are driven to reduce CO_2 emissions in the automotive industry. Osborne (2010), the CEO of the Retail Motor Industry organisation (RMI), argued that, instead of taxing consumers, government needs to introduce incentives in the vehicle market that could lead to CO_2 emissions reductions. These incentives could be funded from taxes already raised to address CO_2 emissions.

All the respondents agreed that it is important that funds be raised from environmental taxes, and that regulation needs to be directed at environmental projects and initiatives. Of the respondents, 86% were supportive of government earmarking the vehicle emission tax as an incentive to invest in CO_2 emission-reduction initiatives. They also agreed that government needs to offer more incentives to vehicle manufacturers to support investment in CO_2 emission reduction.

Although vehicle manufacturers support incentives to reduce CO_2 emissions it will not be beneficial to them as research and development are done by the parent company, which is situated in developed countries. According to Hayashi *et al.* (2001:125–126), policies that are incentive-driven will persuade vehicle manufactures to favour low CO_2 emission alternatives by researching and developing low-emission-type vehicles. A possible spin-off of introducing an incentive in the automotive industry could encourage vehicle manufacturers to do research and development in South Africa, which could bring about more investment and job creation as well.

Currently in South Africa, there are not sufficient tax incentives for investment in CO_2 emission reduction. According to the results of the questionnaire, 86% of vehicle manufacturers disagreed with the statement that current tax incentives for investment in CO_2 emission reductions are sufficiently motivating to make businesses change their behaviour. Therefore, an incentive-driven policy in South Africa could be implemented to motivate businesses change their behaviour towards the environment. A “feebate” policy is an incentive-driven policy as it could motivate businesses to change their behaviour towards the environment.

All of the respondents believed that it is a good idea that a tax system includes incentives for businesses to become carbon-neutral, and 86% of the respondents indicated that these incentives could encourage them to make further investments in reducing CO_2 emissions.

4.3.3 Conclusion

From the above results regarding an incentive-driven policy, it is clear that vehicle manufacturers favour an incentive-driven policy to introduce change in behaviour towards the environment. Vehicle manufacturers remarked that government should take primary responsibility for introducing an incentive-driven policy. Such incentive-driven policy could encourage and motivate manufacturers to invest in energy-efficient technology, thereby saving costs and producing environmentally friendly vehicles.

A “feebate” policy is an incentive-driven policy that can achieve these results. As the merits of a “feebate” policy are explained in section 2.4 and as the results of the questionnaire are analysed, a “feebate” policy could be an effective tool in reducing Co_2 emissions in South Africa. Further studies on the administration of a “feebate” policy could be done in the future.

In South Africa, there are no policies similar to the “feebate” policy. However, there are several sections in the Act according to which vehicle manufacturers could get possible tax incentives (allowances or deductions) to invest in reducing CO_2 emissions. These incentives in the Act are not related to the fees; the taxes that are being levied for reduction in CO_2 emissions. The detail and effectiveness of these incentives for vehicle manufacturers will be discussed in the next section.

4.4 An analysis of current tax incentives utilised by South African vehicle manufacturers to invest in reducing CO_2 emissions

Van der Merwe (2010) argued that South African businesses believe that government plays an important role in environmental policies through legislation and regulation to drive change towards the environment. Current environmental tax and regulation policies in South Africa are the vehicle emission tax and several sections in the Act that relate to tax incentives in order to reduce CO_2 emissions. The following sub-sections examine the responses of vehicle manufacturers’ and their view towards tax legislation in general and tax legislation relating to tax incentives in reducing CO_2 emissions specifically.

4.4.1 South African legislation

In section 4.3.1, it was explained that, according to the responses of vehicle manufacturers, all of regulation, tax incentives and tax charges could be effective in reducing CO_2 emissions if introduced by government. Vehicle manufacturers agreed that tax incentives could be the most effective of these three (Refer to Table 4.1).

Vehicle manufacturers agreed that regulation would assist in achieving CO_2 emission targets if they were set by government. The majority were of the view that tax regulation could be more effective than other regulation in achieving these targets (Refer to Table 4.2).

Based on the results, it is clear that vehicle manufacturers agree that government should be driving tax regulation that could lead to reduced CO_2 emissions and that tax incentives are the most effective in achieving this. The responses of the vehicle manufacturers in the current study agree with responses in a previous study by Van der Merwe (2010) that businesses felt the answer of implementing a policy lays in a combination of “carrot and stick” – tax incentive and regulation. Incentives (“carrot”) are applicable to people adhering to requirements by reducing CO_2 emissions, and regulation (“stick”) for people who do not.

Table 4.3: Perception of vehicle manufacturers on incentives to reduce CO_2 emissions

Questions to vehicle manufacturers about environmental incentives	**Strongly disagree**	**Slightly disagree**	**Slightly agree**	**Strongly agree**
Government needs to offer more incentives to vehicle manufacturers to support investment in CO_2 emission reduction	0%	0%	57%	43%
It is clear which **tax incentives (deductions) currently exist** for investment in CO_2 emission reductions	57%	14%	29%	0%
It is clear **how to apply** for these **tax incentives (deductions) that currently exist** for investment in CO_2 emission reductions	57%	14%	29%	0%
Current tax legislation with regard to **incentives (tax deductions) for investment** in CO_2 emission reductions is too time-consuming/complicated to make it **worth applying for**	25%	0%	25%	50%
Current tax incentives for investment in CO_2 emission reductions are sufficiently **motivating to make businesses change their behaviour**	72%	14%	14%	0%

Table 4.3 is an indication of the way vehicle manufacturers view environmental tax incentives to reduce CO_2 emissions. The following is a short summary of the responses of the vehicle manufacturers:

- Vehicle manufacturers agreed that government needs to offer more incentives for vehicle manufacturers to support investment in CO_2 emission reduction.

- The majority of vehicle manufacturers stated that it is unclear which tax incentives currently exist for investment in CO_2 emission reduction.

- Of the vehicle manufacturers, 71% agreed that it is unclear how to apply for tax incentives, and the rest said they slightly agree on how to apply for incentives that currently exist for investment in CO_2 reduction.

- The majority of vehicle manufacturers agreed that it is either too complicated and time-consuming or they did not know how to apply for incentives.

- Of the vehicle manufacturers, 86% disagreed with the statement that current tax incentives for investment in CO_2 emission reductions are sufficiently motivating to make businesses change their behaviour.

Based on the above results, it can be said that vehicle manufacturers feel that government should take responsibility and offer incentives to vehicle manufacturers to invest in research and development of energy-efficient vehicles. Government should also create an awareness of what incentives are available for vehicle manufacturers to invest in research and development of energy-efficient technology.

The administration process of qualifying for tax incentives needs to be simplified and the incentives received should be material enough to have an impact on vehicle manufacturers' decision to change. Government could investigate the possible implementation of sufficient/material incentives to motivate businesses to change their behaviour towards the environment, as current tax incentives are insufficient to do this.

4.4.2 Current South African tax legislation relating to tax incentives for reducing CO_2 emissions

The Income Tax Act No.58 of 1962Act currently contains incentives in the form of allowances and deductions. These have been set out in Chapter 3. Vehicle manufacturers indicated that it is unclear which tax deductions exist relating to investments in CO_2 emissions reduction for vehicle manufacturers in South Africa.

In the questionnaire, vehicle manufacturers were asked about specific deductions and allowances, as set out in Chapter 3, and whether they use them or not. The responses relating to the individual sections of the Act will now be discussed.

Table 4.4: Specific deductions used by vehicle manufacturers

	Yes	No
Has your company recently **claimed** tax deductions for research and development expenses relating to CO2 emissions reduction [section 11D of the Act]?	0%	100%
Has your company recently claimed tax deductions for incentives for investment in energy-efficient technologies (i.e. generating electricity from sunlight, wind or water,) which could reduce CO2 emissions [section 12B of the Act]?	14%	86%
Has your company recently claimed tax deductions with regard to any environmental capital asset (environmental treatment or recycling asset) as required by law to protect the environment [section 37B of the Act]?	0%	100%

As indicated in Table 4.4, only one of the sections has been used by vehicle manufacturers. When studying the responses on the effectiveness of section 12K, it was found that only one of the vehicle manufactures indicated that they are in the process of establishing a clean development mechanism.

When vehicle manufacturers were asked whether the administration process to claim deductions was easy and whether the deductions they claimed worthwhile, most manufactures did not respond positively as they do not make use of these sections. Thus, a conclusion could not be drawn on whether the administration process to claim deductions was easy and whether the deduction was worthwhile.

4.4.3 Conclusion

The responses of the vehicle manufacturers on tax legislation in general and on the sections in the Act that relate to CO_2 emissions reduction are an indication that the Act (being legislation) does not encourage vehicle manufacturers at all to invest in research and development of energy-efficient technologies to reduce CO_2 emissions.

The vehicle manufacturers explained that they have only recently started with research and development costs for energy-efficient technology. They also stated that most of the research and development costs are the responsibility of their parent companies in other countries. Therefore this can also be a possible explanation why they have not made full use of the incentives available in the Act.

As mentioned before, if material incentives are made available to vehicle manufacturers to invest in energy-efficient technology to reduce CO_2 emissions, then research and development of these technologies can be moved to South Africa. If this is done, there could be major spinoffs in the automotive industry in South Africa, like job creation, more vehicles can be produced and exported out of South Africa and more investment in infrastructure at vehicle manufacturing plants could result.

4.5 General comments received from South African vehicle manufacturers

Vehicle manufacturers worldwide feel the pressure to accommodate change to reduce CO_2 emissions (Rudman, 2008:15). One respondent said that they are encouraged worldwide to change in order to be more environmentally friendly, but these changes are costly and could lead to increased prices of vehicles.

Of the vehicle manufacturers in South Africa, 86% expect to comply with future CO_2 emission initiatives, which could hold a significant cost for their business. Research and development are expensive, and incurring these costs will require changes in their infrastructure, which are also expensive. Vehicle manufactures said that these costs all need to be absorbed by them, which could increase the selling price of vehicles.

Although the changes are costly, 70% of vehicle manufacturers stated that their company is currently investing in ways to reduce CO_2 emissions; thus, doing research and development. Respondents indicated that it is unfortunate that most of the research and development take place in developed countries where the tax systems drive CO_2 reduction, and that the tax system in South Africa does not do that.

Thus, in general, an incentive-driven policy is needed to help accommodate change in the automotive industry and to reduce the cost of research and development of energy-efficient technology. A “feebate” policy could be a policy to drive change and to save costs in order to reduce CO_2 emissions. It appears from the feedback from vehicle manufacturers that they will welcome an incentive-driven policy that could bring about a reduction in CO_2 emissions.

Vehicle manufacturers also mentioned other initiatives that could reduce CO_2 emissions such as the following:

- The fuel price should include a portion of CO_2 tax. They said everybody who pollutes must pay. They explained that it is an easier mechanism in the long term to collect tax. Funds collected this way could possibly be redistributed as incentives.

- South Africa's fuel quality needs to be improved as this could also help with reducing CO_2 emissions.

- Once fuel quality has been resolved, original equipment manufacturers (OEM) can bring already developed, more fuel-efficient vehicles into the country. Thus, lower vehicle emission tax will have to be paid by the consumer.

- More focus could be placed on selling fuel-efficient vehicles.

CHAPTER 5
CONCLUSION

In attempt to reduce CO_2 emissions, the South African government introduced the vehicle emission tax on 1 September 2010. The purpose of this vehicle emission tax is to serve as deterrent for people not to act in a way that is not in the best interest of the environment. Therefore, it would attempt to influence consumer-purchasing decisions (encouraging the purchase of vehicles with lower CO_2 emissions) but because of the focus on consumers, it might not be the most effective way of reducing CO_2 emissions (Nel, 2009:73). Therefore, alternative initiatives need to be identified and implemented to address increasing CO_2 emissions.

This study considered a “feebate” policy as a possible alternative initiative to reduce CO_2 emissions (Greene *et al*., 2005:758; Nel, 2009:73). Currently, there is no such policy in South Africa. Based on the questionnaire circulated to vehicle manufacturers in South Africa and the literature review, findings regarding the following objectives are provided:

- the possible implementation of a “feebate” policy to reduce CO_2 emissions in the South African automotive industry, specifically focusing on vehicle manufacturers; and

- the current tax incentives available to South African vehicle manufacturers to invest in reducing CO_2 emissions in order to determine whether these incentives are utilised by vehicle manufactures.

The following sections conclude on the findings regarding the above two objectives. General comments received from vehicle manufacturers are then discussed and recommendations provided.

5.1 Findings on the possible implementation of a "feebate" policy to reduce CO_2 emissions

From the results of study, it is clear that, for a "feebate" policy to have the necessary effect to change vehicle manufacturers' behaviour (to encourage investments in energy-efficient technology in order to lower CO_2 emissions), it should be implemented by government and lead to cost savings. It was noted that vehicle manufacturers clearly favour an incentive-driven policy above mere legislation which requires compulsory participation (Table 4.1). The respondents indicated that such an incentive-driven policy could encourage and motivate them to invest in energy-efficient technology, thereby saving costs and producing environmentally friendly vehicles.

A "feebate" policy is an incentive-driven policy that can achieve these results and of which the merits are explained in section 2.4. Based on the results of the questionnaire, a "feebate" policy could be an effective tool in reducing CO_2 emissions as it could provide a possible incentive to vehicle manufacturers to invest in the reduction of CO_2 emissions.

Initially 43% of respondents indicated that a "feebate" policy might be perceived as just another tax. This perceptions could, however, be changed if government clearly explained to vehicle manufacturers that the purpose is not to create another means of generating tax but that it is revenue-neutral and can lead to cost savings for vehicle manufacturers. An added benefit of a "feebate" policy is that it, if properly implemented, could be revenue-neutral towards government and that it could increase taxpayers' confidence towards government and towards such a policy.

Therefore, by implementing a "feebate" policy, government will show its commitment to ploughing back into the environmental projects. This will overcome the hurdle of politics, as it is revenue-neutral, and government will show that they are environmentally driven. Although vehicle manufacturers indicated that government should take primary responsibility for introducing an incentive-driven policy, there should be adequate collaboration between relevant parties, specifically vehicle manufactures, when considering implementing a "feebate" policy.

Currently in South Africa, there are no policies similar to the "feebate" policy consider in this study which directly encourages vehicle manufacturers to invest in reducing CO_2 emissions. However, there are several sections in the Act where vehicle manufacturers could qualify for possible tax incentives (allowances or deductions) in respect of expenditure in respect of such investments. The conclusion of the effectiveness of these incentives for vehicle manufacturers will follow in the next section.

5.2 Findings based on the analysis on current tax incentives utilised by South African vehicle manufacturers to invest in reducing CO_2 emissions

Van der Merwe (2010) remarked that businesses feel that the criteria to qualify for current environmental tax incentives are too stringent and that these incentives do not satisfactorily motivate businesses to change behaviour. This sentiment is supported based on the literature review in Chapter 3 and results discussed in Chapter 4 on specific sections of the Act. From the results, it appears that it is arduous to qualify for these tax and consequently might not be that relevant to vehicle manufacturers.

Vehicle manufacturers' responses towards tax legislation in general, and specifically the sections in the Act that relate to CO_2 emissions reduction, are an indication that the Act does not encourage vehicle manufacturers at all to invest in research and development of energy-efficient technologies to reduce CO_2 emissions. All the respondents explained that they only recently started with research and development in terms of energy-efficient technology. They also stated that most of the research and development costs are incurred by their parent companies in other countries.

Research and development of these technologies can be moved to South Africa if material incentives are made available to vehicle manufacturers to invest in energy-efficient technology to reduce CO_2 emissions. If this can be done, there would be major spinoffs in the automotive industry in South Africa like job creation, production of more vehicles and vehicle exports from South Africa, as well as more investment in infrastructure at vehicle manufacturing plants. South Africa can be an example to the rest of Africa in this regard.

Based on the results, it can be concluded that the administration process of qualifying for tax incentives needs to be simplified and the incentives received should be material enough to have an impact on vehicle manufacturers businesses to change. Government could investigate the possible implementation of sufficient/material tax incentives to motivate business to change their behaviour towards the environment as current tax incentives, might be insufficient to do this.

5.3 General comments received from South African vehicle manufacturers

Vehicle manufacturers worldwide feel the pressure to accommodate change to reduce CO_2 emissions (Rudman, 2008:15). One respondent stated they are encouraged worldwide to change in order to be more environmentally friendly, but these changes are costly and could lead to increased prices of vehicles.

Vehicle manufacturers expect to comply with future CO_2 emission initiatives, which could mean significant costs for their business, as the costs of research and development are high. Incurring these costs will require changes in their infrastructure, which will also be expensive. Vehicle manufactures said that all these costs need to be absorbed by them, which could increase the selling price of vehicles.

Although the changes are costly, vehicle manufacturers stated that their companies are currently investing in research and development to reduce CO_2 emissions, They stated that most of the research and development unfortunately take place in developed countries where the tax systems drives CO_2 reduction, and that the tax system in South Africa does not do that.

5.4 Final remarks

This study therefore recommends an incentive-driven policy as instrument to encourage vehicle manufacturers to invest in reducing CO_2 emissions. A “feebate” policy could be a policy to drive change and save costs to reduce CO_2 emissions. From the feedback of vehicle manufacturers it appears that they will welcome an incentive-driven policy that is implemented by government to bring about reduction in CO_2 emissions.

By implementing such a policy, government should be able to generate funds to distribute as incentives. The recently introduced vehicle emission tax could provide possible funding, as reports showed that National Treasury expects to earn about R450 million in the 2010/2011 financial year (Osborne, 2010). Alternative funds can also be generated if the transport fuel levies (usage taxes) and ownership taxes are increased to incorporate CO_2 in the assessment base (Paul, 1997). Therefore, a large amount of funding (“fees”) should be available for government and they should only set a criteria of qualifying for incentives to invest in energy-efficient technology to reduce CO_2 emissions. Implementing a “feebate” policy could be a possibility because, in terms of such a policy, the criteria for investing in energy-efficient technology would be included and should then be communicated to vehicle manufacturers.

Finally, it should be kept in mind that energy-efficient vehicles, which are manufactured in South Africa, will not only be used locally but also exported to other countries (including the USA and Europe). Therefore, investing in energy-efficient vehicles in South Africa could contribute to reducing CO_2 emissions globally in the transport sector.

5.5 Areas of further focus

In the responses received from vehicle manufacturers, the following initiatives where indicated as alternatives, which could reduce CO_2 emissions:

- South African fuel quality needs to be improved as this can also help with reducing CO_2 emissions.

- Once fuel quality has been resolved, original equipment manufacturers (OEM) could bring already developed, more fuel-efficient vehicles into the country. Thus, lower vehicle emission tax will be paid by the consumer.

- The fuel price should include a portion of CO_2 tax. They indicated that everybody who pollutes must pay. They explained that in the long term, it is an easier mechanism to collect tax. This can possibly be redistributed as incentives. Paul (1997) agreed as he stated that possible other sources of income could come from fuel and ownership taxes where a portion of fuel taxes can be allocated to the environment. The effect of these taxes, as seen in Chapter 2, is that it can influence the behaviour of consumers, which could lead to a reduction of CO_2 emissions.

- Another alternative is reducing speed limits, which was introduced in Canada in 1973 (Paul, 1997:138).

- Further research could also be done on power-to-weight limits, as Paul (1997:139) stated that power to weight could produce more fuel-economic engines and more fuel-economic highway driving. It will be easy for manufacturers to comply with this, as they already have different ranges or sizes of vehicles and engines. The only problem here is to inform manufacturers in advance about power-to-weight limits.

These alternative initiatives could be considered in future studies to reduce CO_2 emissions in the automotive industry.

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Annexure 1

Participant:_____

Participant number of years experience in motor vehicle manufacturing industry:_____

Participant's Company:_____

TAX INCENTIVES FOR MOTOR VEHICLE MANUFACTURERS TO REDUCE CO_2 EMISSIONS

Please complete the questionnaire by ticking boxes "X"

1. Who do you think should have **primary responsibility** for leading behavioural change in relation to reducing CO_2 emissions in the automotive industry?[1]

Government	Individuals	Business (the market)	A combination

2. How effective do you feel each of the following tools are/would be at encouraging your business to **reduce its CO_2 emissions**?[1]

	Not effective	Somewhat effective	Very effective
2.1 Regulation			
2.2 Tax incentives			
2.3 Tax charges			

3. If government sets **targets on CO_2 emissions**, which of the following best reflects your company's view of the role that tax regulation and other regulation will have in achieving these targets?[1]

	No role	Some role	Significant role
3.1 Tax regulation			
3.2 Other regulation			

4. How supportive are you of the proposed vehicle emission tax (so-called "vehicle green taxes") **to be levied** on consumers based on CO_2 emissions?[1]

Not supportive	Somewhat supportive	Very supportive

What is your reason for this answer?

5. How supportive would you be if government earmarked the proposed vehicle emission tax (in question 4) to be allocated to vehicle manufacturers **as incentives to invest** in CO_2 emission reduction initiatives (so-called 'feebate")?

Not supportive	Somewhat supportive	Very supportive

What is your reason for this answer?

6. Would you perceive a **"feebate" policy**[2] as just another attempt by government to generate income (another kind of tax)?

Yes	No	Do not know

7. How important do you feel it is to see that **funds raised** from environmental taxes and regulation are being/would be **directed to "green"/ environmental projects and initiatives**?[1]

Not important	Somewhat important	Very important

8. When considering **environmental tax incentives**, how strongly do you agree or disagree with the following statements about government policy?[1]

8.1 The **government needs to offer more incentives** to vehicle manufacturers to support investment in CO_2 emission reduction.

Strongly disagree	Slightly disagree	Slightly agree	Strongly agree

8.2 It is clear which **tax incentives (deductions) currently exist** for investment in CO_2 emission reductions.

Strongly disagree	Slightly disagree	Slightly agree	Strongly agree

8.3 It is clear **how to apply** for these **tax incentives (deductions) that currently exist** for investment in CO_2 emission reductions.

Strongly disagree	Slightly disagree	Slightly agree	Strongly agree

8.4 Current tax legislation with regard to **incentives (tax deductions) for investment** in CO_2 emission reductions is time consuming/complicated to make it **worth applying for**.

Strongly disagree	Slightly disagree	Slightly agree	Strongly agree

8.5 Current tax incentives for investment in CO_2 emission reductions are sufficiently **motivating to make businesses change their behaviour**.

Strongly disagree	Slightly disagree	Slightly agree	Strongly agree

9. What do you think of the idea that the tax system should include **incentives for companies to become carbon neutral**, to encourage environmentally-beneficial activity in the business community?[1]

Not a good idea	Fairly good idea	Very good idea

What is your reason for this answer?

10. Which of the following best reflects your views on the **likely level of change** in the way you conduct business as a result of CO_2 emissions over the next 2-3 years?[1]

No changes	Some changes	Significant changes

What changes do you envisage?

11. Do you expect that future compliance with CO_2 emission initiatives will be a **significant cost** for your company?[1]

Yes significant	Somewhat significant	Not at all

What is your reason for this answer?

12. Is the company you work for **currently investing** in reducing CO_2 emissions?

Yes	No	Do not know

If not, why not?

13. Are you **aware of any tax deductions** relating to investments in CO_2 emissions reduction applicable to vehicle manufacturing?

Yes	No

14. Have your company recently **claimed** tax deductions for **research and development expenses** relating to CO_2 emissions reduction [Section 11D of the Act]?

Yes	No

If not, why not?

15. Have your company recently **claimed** tax deductions for incentives for **investment in energy efficient technologies** (i.e. generating electricity from sunlight, wind or water,) which could reduce CO_2 emissions [Section 12B of the Act]?

Yes	No

16. Have your company recently **claimed** tax deductions with regard to any ***environmental capital asset*** (environmental treatment or recycling asset) as required by law to protect the environment [Section 37B of the Act]?

Yes	No

17. Are you in the process of establishing a **Clean Development Mechanism** ('CDM') project which could result in **tradable credits for certified emissions reduction** [Section 12K of the Act]?

Yes, completed	Yes, in process	No, but will in future	No

If your company is planning to establish a "CDM" project in the future, when do you expect to start with the project?

18. If you claimed any of the above tax deductions (question 14–17), was the **administration process easy**?

Yes	No	Did not claim

19. Was the tax deduction you claimed or the **benefit you received**, if any, for investing in reducing CO_2 emissions **worthwhile. In other words would you do it again**?

Yes	No	Did not claim

20. Would **additional incentives** from government **encourage** your company further investments in reducing CO_2 emissions?

Yes	No

If you have any other suggestions for initiatives for reducing CO2 emissions or any other comments on this study or questionnaire, please state them here:
